REMARKS

Claims 1-5, 7-12 and 14-15 are pending in this application. Claims 1, 2, 8, and 9 have been amended and claims 6 and 13 have been cancelled. Support for the amendments to claims 1 and 8 can be found on page 4, lines 14-16, and page 5, lines 5-6 of the application as filed. No new matter has been added.

Claims 1-15 are rejected under 35 U.S.C. §103(a) for obviousness over U.S. Patent No. 5,468,268 to Tank et al. (hereinafter "Tank"). This rejection is respectfully traversed.

Tank is directed to a method of making an abrasive compact with ultra-hard abrasive particles using elevated temperature and pressure conditions. At least 25 mass % of the ultra-hard abrasive particles has at least three different average particle sizes with an average particle size range of 10-100 microns and at least 4 mass % of the ultra-hard abrasive particles has an average particle size of less than 10 microns.

Amended independent claim 1 is directed to a method for making a metal carbide supported polycrystalline diamond (PCD) compact having improved abrasion resistance properties. The method includes providing a cell assembly. The cell assembly includes a body of diamond crystals having a bimodal mixture of about 60 wt. % to about 80 wt. % of a coarse fraction having an average particle size ranging from about 15 to 70 μm and a fine fraction having an average particle size of less than about one half of the average particle size of the coarse fraction. The cell assembly also includes a support body disposed adjacent the body of diamond crystals and includes a mixture of a carbide of Group IVB, VB, or VIB metal and at least a sintering binder-catalyst in an amount of about or less than 16 vol. % of the total weight of the support body. The cell assembly is then subjected to high pressure high temperature conditions for a sufficient amount of time and at a sufficiently high temperature and high pressure to sinter the body of diamond crystals into a PCD layer and to bond the PCD layer to the carbide body.

Amended independent claim 8 is directed to a sintered supported polycrystalline diamond (PCD) compact having improved abrasion resistance properties. The compact includes a body of diamond crystals and a support body in contact with the body of diamond crystals. The body of diamond crystals includes a bimodal mixture of about 60 wt. % to about 80 wt. % of

a coarse fraction having an average particle size ranging from about 15 to 70 μm and a fine fraction having an average particle size of less than about one half of the average particle size of the coarse fraction. The support body includes a mixture of a carbide of Group IVB, VB, or VIB metal and at least a sintering binder-catalyst in an amount of about or less than 16 vol. % of the total weight of the support body.

Tank fails to teach or suggest a method for making a metal carbide supported polycrystalline diamond compact as recited in amended independent claim 1 or a sintered supported polycrystalline diamond compact as recited in amended independent claim 8. In particular, Tank fails to teach or suggest a polycrystalline diamond compact having a support body having at least a sintering binder-catalyst in an amount of about or less than 16 vol. % of the total weight of the support body. Rather, Tank teaches a binder present in an amount of 10 to 20 percent by mass. When converted to volume percent for comparison purposes, Tank teaches a binder content of about 17.7 to 35.2 vol. %, which clearly exceeds the 16 vol. % of the present claimed invention. Therefore Tank does not teach or suggest a binder catalyst in an amount of about or less than 16 vol. % of the total weight of the support body as recited in amended independent claims 1 and 8.

Moreover, while Tank discloses that the binder content may be as low as 6 percent by mass (about 10.56 vol. %), when considered as a whole and in its entirety, Tank still fails to teach or suggest combining the binder content of about less than 16 vol. % in combination with the bimodal diamond particle composition recited in the independent claims. In particular, col. 3 lines 12-13 of Tank states that the invention is characterized by the abrasive particle mixture, thereby further limiting Tank's teachings to that of particle mixture and not the combination of controlling the particle mixture and the sintering binder-catalyst as in the present claimed invention. For all the foregoing reasons, Applicants respectfully request reconsideration of the Examiner's rejection of amended independent claims 1 and 8.

Claims 2-5 and 7, and claims 9-12 and 14-15, depend directly or indirectly from and add further limitations to amended independent claims 1 and 8, respectively, and are deemed to be patentable for at least the same reasons discussed hereinabove in connection with amended independent claims 1 and 8, respectively. Reconsideration of the rejection of claims 2-5, 7, 9-12, and 14-15 is respectfully requested.

Claims 1-15 are rejected under 35 U.S.C. §103(a) for obviousness over U.S. Patent No. 6,132,675 to Corrigan et al. (hereinafter "Corrigan"). This rejection is respectfully traversed.

Corrigan is directed to a high pressure high temperature method for making a metal carbide supported PCD compact. Corrigan discloses a mass of diamond particles having about 2-15 wt.% of submicron sized diamond particles having particle sizes ranging from about 0.01-1 micron and large sized diamond particles having particle sizes ranging from about 5-100 microns.

Corrigan fails to teach or suggest a method for making a metal carbide supported polycrystalline diamond compact as recited in amended independent claim 1 or a sintered supported polycrystalline diamond compact as recited in amended independent claim 8. In particular, Corrigan fails to teach or suggest a body of diamond crystals having a bimodal mixture of about 60 wt. % to about 80 wt. % of a coarse fraction as recited in amended independent claims 1 and 8. Corrigan discloses a bimodal composition of 2-15 wt. % fine particles and the balance being large sized particles. Thus, Corrigan teaches a diamond particle composition of 85-98 wt. % large particles which is clearly above the about 60 wt. % to about 80 wt. % of a coarse fraction as recited in amended independent claims 1 and 8.

Moreover, Corrigan teaches away from the range of coarse particles as disclosed in amended independent claims 1 and 8. More specifically, Corrigan discloses in col. 6, lines 5-8, that the fine sized diamond component ranges from 2 to 15 wt. %, preferably from 2 to 8 wt. % and most preferably from 4 to 8 wt. %, thereby defining the large sized diamond component to be 92-98 wt. % and more preferably 92-96 wt. %. Therefore, Corrigan teaches away from a coarse fraction amount of about 60 wt. % to about 80 wt. %. For all the foregoing reasons, Applicants respectfully request reconsideration of the Examiner's rejections of amended independent claims 1 and 8.

Claims 2-5 and 7, and claims 9-12 and 14-15, depend directly or indirectly from and add further limitations to amended independent claims 1 and 8, respectively and are deemed to be patentable for at least the same reasons discussed hereinabove in connection with amended independent claims 1 and 8, respectively. Reconsideration of the rejection of claims 2-5, 7, 9-12, and 14-15 is respectfully requested.

In view of the foregoing, reconsideration of the Examiner's rejection and allowance of pending claims 1-5, 7-12, and 14-15 is respectfully requested. Should the Examiner have any questions regarding any of the information provided, the Examiner is invited to contact Applicants' undersigned representative by telephone at 412-454-5000.

Respectfully submitted,

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